



Newsletter

Volume 11, Number 2
March - April 1994

Director's Note

The Institute is starting another important contribution to the field of ecology education with a program called "Schoolyard Ecology for Elementary School Teachers".

The best way — in fact perhaps the only way — for children to gain an appreciation for the environment and to begin to understand the nature and importance of ecological relationships is to come face-to-face with soil, water, plants, animals and all of the other components of ecosystems. With guidance and encouragement, young people learn to observe and ask questions. Very quickly they are caught up in the challenge and excitement of discovery.

This summer, kindergarten through 6th grade teachers in 14 states across the country will be trained to use their own schoolyards as classrooms. Our cover story describes this exciting new program.

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Teachers and Scientists: Partners in Elementary Education

- How is the non-living environment "viewed" by organisms?
- What adaptations do schoolyard organisms have for surviving there?
- Are all organisms in the schoolyard environment really "connected"?
- How can students learn ecological principles if they've never been outside the classroom?



CATHERINE COREY

Lead-ecologist Dr. Alan Berkowitz, head of education at IES, and lead-teacher Linda Olsen (Noxon Rd. School, Poughkeepsie, N.Y.) make up one of the SYEFEST teams. At the Leadership Workshop they planned schoolyard ecology projects, such as a census of plants in a marked plot.

Our relationship with the natural world is a delicate one, and we are reminded constantly of the detrimental effects of human-accelerated environmental change. The need for us to understand the ecological basis of environmental problems, therefore, has never been greater. Activities that promote ecological literacy can and should be a part of school curricula, addressing questions like those listed above.

These questions represent some of the topics for the new Institute of Ecosystem Studies project called SYEFEST: Schoolyard Ecology for Elementary School Teachers. The ultimate goal of this project is to help elementary school students learn ecology by studying and interacting with local organisms and environments. Where better to do this than in schoolyards, right nearby, where there is easy access and where discovery is more meaningful since students and teachers already are familiar with the area.

SYEFEST was developed by IES educators Dr. Alan R. Berkowitz and Ms. Kass Hogan, and in February the Institute received a National Science Foundation grant to implement the two-year project. The project's objectives are to help elementary school teachers 1) recognize the resources within their schoolyard environ-

ment and maximize the potential for ecological investigations; 2) understand and be able to teach the processes of science through a discovery approach; and 3) be comfortable being with and teaching their students in an outdoor "classroom".

The first step was to pair each of 15 ecologists from around the country with an elementary school teacher in a nearby school. These lead-ecologist/lead-teacher teams participated in a SYEFEST Leadership Workshop in Gainesville, Florida early in March. The Leadership Workshop was facilitated by Dr. Berkowitz, Ms. Hogan and SYEFEST project coordinator Ms. Catherine Corey (IES), and brought in the talents of Dr. Peter Feinsinger, a research ecologist from Northern Arizona University, and Ms. Karen Hollweg, from the North Ameri-

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ALAN BERKOWITZ

Dr. Peter Feinsinger and Ms. Kass Hogan test a simple device to measure leaf strength, while Dr. Kathy Winnett-Murray looks on. A goal of SYEFEST coordinators is to help teachers develop schoolyard ecology experiments that use everyday materials.

can Association of Environmental Education. Time was spent developing a common approach to schoolyard ecology by actually doing it. The 15 teacher-ecologist teams explored local schoolyards, formulated questions for investigation, conducted experiments and analyzed their findings. During indoor sessions, the group discussed project goals, outlined expectations and shared approaches to teaching science out-of-doors. Finally, each team had time and support to plan and share their ideas about the next step in the program: the SYEFEST Summer Institutes.

Each teacher-ecologist team will be leading a 10-day SYEFEST Summer Institute to train teachers from local school districts. Ten elementary school teachers will participate in each institute, learning how to use their own schoolyards as classrooms. As a result, during the 1994-95 school year, 150 teachers from across the U.S. will be introducing their students to the ecology of areas previously used primarily for gym and recess. Ms. Linda Olsen, who teaches 5th grade at Noxon Road School in Poughkeepsie, N.Y., is a SYEFEST lead-teacher teamed with Dr. Berkowitz. They will be leading a Summer Institute in local schoolyards from 27 June - 9 July, thereby making Dutchess County educators among the first to participate in this project.

Early in 1995, SYEFEST coordinators will bring the teams back together to review the successes and failures of the Summer Institutes and the new schoolyard ecology efforts. During this second workshop they will also start work on the third stage of the program: the development of a manual for teachers and ecologists who will be trainers in future Schoolyard Ecology Institutes.

Written evaluations were requested of participants in the March Leadership Workshop. In her comments, lead-ecologist Dr. Kathy Winnett-Murray (Hope College, Holland, Michigan) summarized the SYEFEST goals and philosophy:

Bringing educators from different levels together is inevitably bumpy, but absolutely essential to accomplish the common goals that we have in education in general and ecology in particular. It is for a like this where we can become better aware of other educational levels, learn from them, compliment each other, that will go a long way toward building the bridges that must be built for ecologists to contribute to better ecology education. ...

We are teams and that's the only way we'll successfully attain our goals... We need to be encouraged and guided into ways of learning how our different skills and knowledge bases are complimentary.

Director's Program for Visiting Distinguished Scientists*

The Institute is sponsoring a series of visits by distinguished scientists during the 1993-94 academic year. Each scientist stays at the Institute for a week of interaction with IES scientific staff, and presents a Friday afternoon lecture as part of the regular public seminar series. The three participating ecologists are:

- Dr. Pamela Matson, Professor of Ecosystem Ecology, Department of Environmental Science, Policy and Management, University of California at Berkeley;
Dr. Diane M. McKnight, Research Hydrologist, Water Resources Division, U.S. Department of the Interior Geological Survey
Dr. Ingrid C. Burke, Assistant Professor in the Department of Forest Sciences and Research Associate at the Natural Resources Ecology Laboratory, Colorado State University.



Visiting Distinguished Scientist Dr. Diane McKnight spent a week at the Institute in November 1993.

At left, l. to r.: IES Director Dr. Gene E. Likens, Dr. Nina Caraco, who was Dr. McKnight's IES host, and Dr. McKnight.

* Funding for this program was provided by The Merrill Lynch & Company Foundation, Inc.

IES Notes

Protection of soil quality

IES microbial ecologist **Dr. Peter M. Groffman** is a member of the Committee on Long-Term Soil and Water Conservation Policy of the National Research Council's Board on Agriculture. On 17 November 1993, that committee released an important new report, *Soil and Water Quality: An Agenda for Agriculture*. Dr. Groffman was one of four committee members who presented the report in Washington D.C. at a congressional briefing, at a briefing for the U.S. Department of Agriculture and the Environmental Protection Agency, and at a public press conference.

In its report, the 15-member committee of experts stressed that efforts to protect soil quality deserve the same attention as those for air and water, and offers information on improved management of nitrogen, phosphorus, manure, pesticides, sediments, salt and trace elements.

Soil and Water Quality: An Agenda for Agriculture is available from the National Academy Press by calling 800/624-6242 (\$54.95 plus \$4.00 shipping).

Review of government report

Dr. Charles D. Canham, a plant ecologist at IES, is a member of the six-person joint Ecological Society of America (ESA) and American Institute of Biological Sciences (AIBS) ad hoc committee charged with evaluating the ecological aspects of the Clinton Administration's Forest Ecosystem Management Assessment Team (FEMAT) report. The 1000-page FEMAT report is a management plan for the Pacific Northwest forests, presenting 10 forest management options for maximizing harvests while protecting the endangered old-growth forest ecosystem.

According to the *ESA Washington Office Newsletter*, "The ESA/AIBS ad hoc committee review gives the FEMAT [report] high marks for focussing on ecologically meaningful units, an ecosystem approach to management, and a broad taxonomic focus." The newsletter adds, however, that the committee found some shortcomings in the report, from an ecological viewpoint. Among these shortcomings were an insufficient emphasis on the likely risks to organisms and ecological processes, the failure to use an experimental approach in the design of adaptive management areas, and the failure to draw upon all existing data.

Beginning in July! IES Ecology Day Camp

One-week sessions for children
ages 6-12.

Call 914/677-5359 for information.

International collaboration

Dr. Steward T.A. Pickett, an IES plant ecologist, presented "Ecological development", a paper co-authored by **Dr. Moshe Shachak** (ecologist; IES adjunct scientist), **Dr. Bertrand Boeken** (ecologist; former IES postdoctoral associate) and **Dr. Juan J. Armesto** (plant community ecologist; IES adjunct scientist), at the "International Conference on Regional Development: The Challenge of the Frontier", held in January 1994 at a hotel at The Dead Sea in Israel. The point of the paper was to try to figure out a way to bring ecology into the early part of the development process, and to build a more constructive dialogue between ecologists and developers. During the 10 days he spent in Israel, Dr. Pickett also worked with collaborators on the Savannization Project (see the January - February 1994 issue of the IES Newsletter.)

From there he traveled to South Africa where he was one of 10 overseas speakers at the 20th Annual Congress of the South African Association of Botanists, hosted by the Dept. of Botany at the University of Witwatersrand. There, he presented "Understanding vegetation dynamics: Multiple goals, pathways, and scales", a paper co-authored with **Dr. V. Thomas Parker** (San Francisco State Univ.), who spent a three-month sabbatical at IES in 1993.

New findings on acid rain

Dr. Lars O. Hedin, a former Ph.D. student of Dr. Likens at IES, **Dr. Gene E. Likens** (ecologist; IES director), and **Mr. Thomas J. Butler** (manager of the Ithaca precipitation chemistry site) are co-authors (with four other colleagues) of "Steep declines in atmospheric base cations in regions of Europe and North America", published in *Nature* (27 January 1994).

Airborne emissions of sulfur dioxide from industrial plants contribute to acid rain, and it was anticipated that as emissions were reduced through legislation, the harmful effects of acid rain on the environment would be reduced.

This paper describes recent research that showed sharp declines in base cation concentrations in precipitation in eastern North America and northwestern Europe. The reduction in these alkaline materials tends to offset the potential benefits of reduced sulfate emissions on acid rain and its ecological effects.



While he was in South Africa, Dr. Pickett toured one of his host's research sites. Here, at the edge of a grassland, the group examines a termite mound that had been broken open by an aardvark. Because of their role as general vegetation eaters, termites are major agents of disturbance and nutrient cycling in South Africa.

Standing, l. to r.: Dr. Tim O'Connor (Döhne Agricultural Development Institute, Stutterheim, South Africa); Professor Kevin H. Rogers (Dept. of Botany, Univ. of Witwatersrand, and co-director of the Center for Water in the Environment), Dr. Pickett's host; and Dr. Pickett. In the foreground is Dr. Evan Weiher (University of Ottawa, Canada).

Hudson River

IES aquatic ecologists **Drs. Stuart E.G. Findlay** and **David L. Strayer** were participants in "Who's Doing What? A Conference On: Hudson River Research, Monitoring and Informational Programs", sponsored by The Hudson River Environmental Society, Inc. and held at Marist College in Poughkeepsie, N.Y. on 16 March 1994. Each scientist summarized his ongoing research on the Hudson River ecosystem; Dr. Findlay's presentation was "Studies on the lower food web of the Hudson River", while Dr. Strayer spoke on "Zebra mussel monitoring studies in the Hudson River".

Publications recognized

Science Watch, the newsletter of the Institute for Scientific Information, has begun to devote more attention to the rapidly developing field of research in ecology and environmental science. This past November it published a list of the 10

leading scientific papers in these areas, those papers published in 1987, 1988 and 1989 that were most cited in other scientific papers by the end of 1992. One of these 10 papers, cited by scientists 110 times over that period, is by three IES ecologists, **Dr. Jonathan J. Cole**, **Dr. Stuart E.G. Findlay**, and **Dr. Michael L. Pace**: "Bacterial production in fresh and saltwater ecosystems: A cross-system overview", *Marine Ecology-Progress Series*, 43 (1-2):1-10, 1988.

Dr. Michael L. Pace's paper "Sampling larval fish populations: Choice of a sample number and size" (co-authored with **Dr. Hélène Cyr** and **Dr. Stephen Baines** — both of whom received their Ph.D. degrees for research done at IES — and with Dr. John A. Downing and Sophie Lalonde, Univ. of Montreal) was selected as the most significant paper in the 1992 Volume of the *Transactions of the American Fisheries Society* by the AFS Publication Awards Committee.

Lyme disease vaccine study

Thirty-seven IES personnel, including several spouses, are part of a New York Medical College study to evaluate the protective efficacy of a new vaccine against Lyme disease. The study's participants — approximately 8,000 volunteers in all — have been divided into two groups: one group is receiving a vaccine made by recombinant DNA technology from the purified protein of the Lyme disease bacterium, while the other is receiving a saline placebo. The study is double-blind, meaning that neither the participants nor the on-site investigators know which group each subject is in, and only after the nine-month observation period is finished will correlations be made. Subjects received the first injection in early March and the second in early April. Each will be contacted regularly to monitor for Lyme disease symptoms. Vertebrate ecologist **Dr. Richard O. Ostfeld**, who is doing on-going research on the ecology of Lyme disease at the Institute, coordinated IES participation in the vaccine study.

Recent books by IES scientists

Kemp, Paul F., B.F. Sherr, E.B. Sherr and **Jonathan J. Cole**, eds., *Handbook of Methods in Aquatic Microbial Ecology*, Lewis Publishers, 1993.

Likens, Gene E., *The Ecosystem Approach: Its Use and Abuse*, Ecology Institute, Oldendorf/Luhe, Germany, 1992.

McDonnell, Mark J. and **Steward T.A. Pickett**, eds., *Humans as Components of Ecosystems: The Ecology of Subtle Human Effects and Populated Areas*, Springer-Verlag, 1993.

Calendar

CONTINUING EDUCATION

Brochures describing **spring semester** classes, workshops and excursions are available from the Gifford House. Program highlights include:

- Apr. 27: **Plants for Summer Container Gardens**
- May 11: **History of Native Peoples** (excursion)
- May 12 & 14: **Spring Mushrooms**
- May 14: **Ecology of the Shawangunks and Exploration of the Ancient Ice Caves** (exc.)
- May 14 & June 4: **Dried Flower Techniques and Applications** (crafts course)
- May 22: **Stalking the Wild Orchids** (exc.)
- June 4: **Catskill Mountain Ecosystems** (exc.)
- June 7: **Wave Hill and The Cloisters** (exc.)
- June 10: **Destination: Hillside Gardens** (exc.)
- June 11: **Outdoor Sketching**
- June 18: **Ecology and Earth History: The Hudson Highlands** (exc.)
- June 18 & 25: **Field Course: Fern Identification and Propagation**

The IES Continuing Education Program office has a new telephone number. Call 914/677-9643 for information on certificate programs or individual offerings, or to register.

SUNDAY ECOLOGY PROGRAMS

Free public programs are held on the first and third Sunday of each month, except over holiday weekends. Programs begin at 2 p.m. at the Gifford House on Route 44A unless otherwise noted below. Last-minute schedule changes are sometimes unavoidable, so call 914/677-5359 to confirm the day's topic.

- May 1: **Monitoring the Health of the Forest**, a walk led by Dr. Gary Lovett
- May 15: **Ecology Challenge Trail ... A Game for the Whole Family**, an activity led by Dr. Alan Berkowitz

For general information, call the IES Education Program Office at the Gifford House Visitor and Education Center: 914/677-5359 weekdays from 8:30 - 4:30.

Sunday Ecology Programs, continued

- June 5: **A Stream Walk**, led by Dr. David Strayer
- June 19: **Wetlands Plants: A Functional Beauty**, a walk led by Gay Hanson

• *In case of poor weather, call 677-5358 after 1 p.m. to learn the status of the day's program. For outdoor programs, wear long pants tucked into socks and sturdy waterproof shoes.*

IES SEMINARS

The Institute's program of scientific seminars features presentations by visiting scientists. These free seminars are held each Friday at 3:30 p.m. in the Plant Science Building. Last-minute schedule changes are sometimes unavoidable, so call 914/677-5343 to confirm the day's topic.

- Apr. 22: **Masting Behavior in Oaks**, Dr. Victoria L. Sork, Univ. of Missouri
- Apr. 29: **Patterns of Invertebrate Production in Running Waters with Special Reference to Blackwater Rivers**, Dr. Arthur Benke, Univ. of Alabama
- May 6: **Effects of Disturbance on Trace Gas Emissions in Terrestrial Ecosystems**, Dr. Iris Anderson, College of William and Mary
- May 13: **Below-ground Carbon Dynamics in Forests and Cattle Pastures in the Eastern Amazon**, Dr. Eric Davidson, Woods Hole Research Center

GREENHOUSE

The IES greenhouse is a year-round tropical plant paradise as well as a site for controlled environmental research. The greenhouse is open until 4:00 p.m. daily except public holidays. Admission is by free permit from the Gifford House.

IES GIFT AND PLANT SHOP

Senior Citizens Days: On Wednesdays, senior citizens receive a 10% discount (except sale items).
Pre-Inventory Sale: May 1-20; gifts and plants 20% off, books 10% off.
Annual Perennial Sale: May 20 - 22 (Friday - Sunday).

HOURS

Winter hours: October 1 - April 30.
(Summer hours begin May 1*.)
Closed on public holidays.

Public attractions are open Mon. - Sat., 9 a.m. - 4 p.m. & Sun. 1 - 4 p.m.

*From May 1 - Sept. 30, outdoor attractions remain open until 6:00 p.m.

The **IES Shop** is open Mon.- Sat., 11 a.m. - 4 p.m. & Sun. 1 - 4 p.m. (The shop is closed weekdays from 1 - 1:30 p.m.)

*During the summer, the shop is open until 5 p.m. daily.

• *All visitors must pick up a free permit at the Gifford House Visitor and Education Center on Route 44A for access to IES public attractions. Permits are available until 3:00 p.m. daily until the end of April and until 5:00 p.m. through the summer.*

MEMBERSHIP

Become a member of the Institute of Ecosystem Studies. Benefits include a member's rate for IES courses and excursions, a 10% discount on Gift Shop purchases, a free subscription to the IES Newsletter, and participation in a reciprocal admissions program, with benefits at over 100 nature centers, forest preserves, gardens and conservatories in the U.S. and Canada. Individual membership is \$30; family membership is \$40. For information on memberships, call Janice Claiborne at 914/677-5343.

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